



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/583,738

04/16/2007

Kenji Nakamura

46969-5446

8614

55694 7590 12/20/2007  
DRINKER BIDDLE & REATH (DC)  
1500 K STREET, N.W.  
SUITE 1100  
WASHINGTON, DC 20005-1209

EXAMINER

WILSON, BRYAN E

ART UNIT

PAPER NUMBER

2891

MAIL DATE

DELIVERY MODE

12/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/583,738	Applicant(s) NAKAMURA ET AL.	
	Examiner Bryan E. Wilson	Art Unit 2891	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/16/2007</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Kudo (Kudo et al., "Organic static induction transistor for display devices", Synthetic Metals, 111-112 (2000) 11-14).
  - a. Regarding claim 1, Kudo discloses an organic display device comprising an emissive layer in combination with a static induction transistor (SIT) having a first electrode (source or drain), a second electrode (source or drain), and an emission layer (Alq<sub>3</sub> layer) provided between the first and second electrodes (see e.g. Fig. 1b), comprising: an organic semiconductor layer (CuPc) provided between the first electrode and the emission layer (see e.g. Fig. 1b), having an absorption band within an emission wavelength band of the emission layer (see e.g. Fig. 2); and a control electrode (Aluminum gate) electrically coupled to the organic semiconductor layer (also see section titled "Introduction" on first page of article).

- b. Regarding claim 2, the reference further discloses that the organic semiconductor layer includes a light absorption layer having the absorption band (CuPc layer absorbs light at some location within the material, this location must be the layer that absorbs light), and the control electrode contacts the light absorption band (see e.g. Fig. 1b)
- c. Regarding claims 3-4, the reference further discloses that the organic semiconductor layer includes a light absorption layer having the absorption band (CuPc layer absorbs light at some location within the material, this location must be the layer that absorbs light; see Fig. 1b and Fig. 2), and the control electrode is buried in the light absorption layer and formed between the control electrode and the first electrode (the aluminum gate is surrounded by CuPc; see e.g. Fig. 1b)
- d. Regarding claim 6, the reference further discloses that the SIT structure is similar to an inorganic thyristor structure. While the reference does not specifically detail the current-voltage characteristics, it does detail the structure claimed by Applicant and must therefore also have been capable of the same functions and results.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kudo (Kudo et al., "Organic static induction transistor for display devices", Synthetic Metals, 111-112 (2000) 11-14) and further in view of Park '026.

- a. Kudo discloses the invention as applied to claim 1 above but does not explicitly recite that the Alq3 layer is doped. However, park discloses Alq3 as an organic emitting layer that is doped with nile red organic fluorescent dye in order to improve light emitting efficiency and durability (see [0027]). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to dope the Alq3 light emitting layer of Kudo with the nile red dopant taught by Park in order to improve light emitting efficiency and durability.

7. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kudo (Kudo et al., "Organic static induction transistor for display devices", Synthetic Metals, 111-112 (2000) 11-14) and further in view of Iechi '952.

- a. Regarding claim 7 and 8, Kudo discloses the invention as applied to claim 1 above but does not explicitly recite a hole transport layer provided between the first electrode and the emission layer, or an electron transport layer provided between the second electrode and the emission layer, wherein the first electrode and the second electrode are an anode and a cathode, respectively.

However, Iechi discloses an organic transistor capable of emitting light at high luminescence efficiency having a hole transport layer ('hole injecting layer 66') between the first electrode ('anode' or 'drain') and the emitting layer in order to eliminate the barrier for hole injection resulting in higher quantum efficiency (see [0038]-[0045], and ). Iechi further discloses an electron transport layer ('electron injection layer 67') between the second electrode ('source' which must necessarily then act as a cathode) which reduces electron injection resistance and a large electric power can be handled. Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to form a hole transport layer between the first electrode and the emitting layer and to form an electron transport layer between the second electrode and the emitting layer as taught by Iechi in the structure of Kudo in order to increase quantum efficiency and to handle a large electric power.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan E. Wilson whose telephone number is (571) 270-1568. The examiner can normally be reached on Monday through Friday 8:00am-4:30pm E.S.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BW  
12-13-2007



**B. WILLIAM BAUMEISTER**  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800